

WHAT IS CLAIMED IS:

1           1.     A hybrid router that is capable of operating as a fixed base router or  
2 a plunge router, comprising:

3                 a motor assembly having a housing containing a motor for driving an  
4 output shaft to which a bit holding mechanism can be attached, operating handles  
5 attached to said housing for use by an operator, and operating controls for operating said  
6 motor;

7                 a fixed base assembly into which said motor assembly can be removably  
8 installed, said fixed base assembly having a planar bottom surface, a depth adjustment  
9 mechanism and a first motor assembly locking mechanism for removably locking said  
10 motor assembly in said fixed base assembly; and,

11                a plunge base assembly having a motor carrier assembly and a sub-base  
12 structure having a planar bottom surface and a pair of spaced vertical guide posts along  
13 which said motor carrier assembly can be vertically moved, a plunge locking mechanism  
14 for selectively holding said carrier assembly at a particular vertical position along said  
15 guide posts, said plunge base assembly having a second motor assembly locking  
16 mechanism for removably locking said motor assembly in said motor carrier assembly,  
17 and a depth control mechanism for establishing a desired depth of cut when said motor  
18 carrier assembly is vertically moved toward said sub-base during operation.

1           2.     A router as defined in claim 1 wherein said motor assembly further  
2 comprises a depth adjustment controller that controls the depth of cut of a bit when said

3 motor assembly is installed in either of said fixed base assembly or said plunge base  
4 assembly.

1 3. A router as defined in claim 2 wherein said depth adjustment  
2 controller comprises a knob that is located on the top of one side of the motor assembly  
3 housing, rotation of the knob causing the depth of cut to be increased or decreased  
4 depending upon the direction of rotation.

1 4. A router as defined in claim 3 wherein said knob can be extended  
2 from said motor assembly for improved operator access and then retracted as desired.

1 5. A router as defined in claim 1 wherein said operating handles  
2 comprise a pair of handles, each of which extend from an opposite side of the housing in  
3 a generally horizontal direction and which merge with a generally vertical portion.

1 6. A router as defined in claim 1 wherein said motor operating controls  
2 include an on/off motor switch located in one of said handles.

1 7. A router as defined in claim 1 wherein said fixed base assembly  
2 comprises a formed base portion having a vertical central opening in which a major  
3 portion of said motor assembly housing can be inserted, the outer configuration of the  
4 major portion of said motor assembly that is inserted generally conforming to the  
5 configuration of the inner surface of the formed base portion such that the motor  
6 assembly can be vertically moved therein during installation and removal and to adjust  
7 the depth of cut of an installed bit, said formed base portion having at least one segment  
8 of relatively thin wall around the circumference thereof, said first motor assembly  
9 locking mechanism comprising:

10 an elongated live hinge in said one thin wall segment, said hinge having  
11 one end integral with said wall and an unattached opposite free end;

12 a clamp lever operably attached to the outside of said formed base portion  
13 and pivotable between locking and unlocking positions, said clamp lever having a cam  
14 surface for engaging the free end portion of said hinge, said cam surface moving said free  
15 end portion inwardly to press against said motor assembly housing for securely holding  
16 the same when said clamp lever is pivoted into said locking position.

1 8. A router as defined in claim 7 wherein said live hinge is formed by  
2 an absence of wall material along the periphery of said hinge, said hinge being generally  
3 horizontally oriented and having one end integral with said wall, with the length of said  
4 hinge including its opposite end being unconnected to said wall.

1 9. A router as defined in claim 8 further comprising a set screw  
2 inserted in a threaded aperture located in said free end portion of said hinge, said set  
3 screw being rotatably adjustable to vary the amount of inward movement of said free end  
4 portion that occurs when the lever is pivoted into said locking position.

1 10. A router as defined in claim 1 wherein said motor carrier assembly  
2 comprises a formed base portion having a vertical central opening in which a major  
3 portion of said motor assembly housing can be inserted, the outer configuration of the  
4 major portion of said motor assembly that is inserted generally conforming to the  
5 configuration of the inner surface of the formed base portion such that the motor  
6 assembly can be vertically moved therein during installation and removal, said formed

base portion having at least one segment of relatively thin wall around the circumference thereof, said second motor assembly locking mechanism comprising:

an elongated live hinge in said one thin wall segment, said hinge having one end integral with said wall and an unattached opposite free end;

a clamp lever operably attached to the outside of said formed base portion and pivotable between locking and unlocking positions, said clamp lever having a cam surface for engaging the free end portion of said hinge, said cam surface moving said free end portion inwardly to press against said motor assembly housing for securely holding the same when said clamp lever is pivoted into said locking position.

11. A router as defined in claim 10 wherein said live hinge is formed by an absence of wall material along the periphery of said hinge, said hinge being generally horizontally oriented and having one end integral with said wall, with the length of said hinge including its opposite end being unconnected to said wall.

12. A router as defined in claim 11 further comprising a set screw inserted in a threaded aperture located in said free end portion of said hinge, said set screw being rotatably adjustable to vary the amount of inward movement of said free end portion that occurs when the lever is pivoted into said locking position.

13. A router as defined in claim 7 wherein said major portion of said motor assembly housing that is inserted into said fixed base assembly has an outer configuration that varies sufficiently throughout its vertical dimension that would produce a deviation of the output shaft from perpendicular to said planar bottom surface, said major portion of said motor assembly housing having at least one vertical recess in

6 the outer configuration opposite the side that is contacted by said live hinge, said recess  
7 extending from the bottom upwardly therefrom, said recess having a flat bottom that is  
8 parallel to said output shaft, said fixed base assembly having an inwardly protruding  
9 vertically oriented rail with a top surface that is perpendicular to said fixed base planar  
10 bottom surface, said rail top surface engaging said recess flat bottom when said first  
11 locking mechanism clamp lever is pivoted into said locking position, thereby assuring  
12 that said output shaft is perpendicular to said fixed base planar bottom surface.

1 14. A router as defined in claim 10 wherein said major portion of said  
2 motor assembly housing that is inserted into said motor carrier assembly has an outer  
3 configuration that varies sufficiently throughout its vertical dimension that would  
4 produce a deviation of the output shaft from perpendicular to said sub-base planar bottom  
5 surface, said major portion of said motor assembly housing having at least one vertical  
6 recess in the outer configuration opposite the side that is contacted by said live hinge,  
7 said recess extending from the bottom upwardly therefrom, said recess having a flat  
8 bottom that is parallel to said output shaft, said motor carrier assembly having an  
9 inwardly protruding vertically oriented rail with a top surface that is perpendicular to said  
10 fixed base planar bottom surface, said rail top surface engaging said recess flat bottom  
11 when said second locking mechanism clamp lever is pivoted into said locking position,  
12 thereby assuring that said output shaft is perpendicular to said sub-base planar bottom  
13 surface.

1 15. A router as defined in claim 7 wherein said motor assembly has a  
2 second vertical recess adjacent where said live hinge contacts said motor assembly, said

3 second recess extending from the bottom thereof upwardly at least a distance equal to the  
4 depth of cut adjustment distance, an outwardly extending retractable stop button slidably  
5 retained in said second recess and biased outwardly for engaging an interior stop surface  
6 of said fixed base assembly to prevent removal of said motor assembly therefrom, said  
7 fixed base assembly having a base release button that is configured to engage said stop  
8 button and release the same to permit removal of said motor assembly from said fixed  
9 base assembly.

1           16. A router as defined in claim 10 wherein said motor assembly has a  
2 second vertical recess adjacent where said live hinge contacts said motor assembly, said  
3 second recess extending from the bottom thereof upwardly at least a distance equal to the  
4 depth of cut adjustment distance, an outwardly extending retractable stop button slidably  
5 retained in said second recess and biased outwardly for engaging an interior stop surface  
6 of said plunge base assembly to prevent removal of said motor assembly therefrom, said  
7 plunge base assembly having a base release button that is configured to engage said stop  
8 button and release the same to permit removal of said motor assembly from said plunge  
9 base assembly.

1           17. A router as defined in claim 1 wherein said depth control mechanism  
2 comprises:

3           a support member attached to said sub-base structure;  
4           an indicator operatively connected to said support member;  
5           an indicator surface located on said motor carrier assembly positioned to  
6 contact said indicator.

1           18. A router as defined in claim 17 wherein said support member is an  
2 elongated member and said indicator is an elongated tube having a pointer at its upper  
3 end, said indicator being adjustable relative to said support member.

1           19. A router as defined in claim 18 further comprising a spring for  
2 biasing said indicator upwardly into contact with said indicator surface.

1           20. A router as defined in claim 19 wherein said sub-base structure  
2 includes a depth scale located adjacent said pointer for providing a visual indication of  
3 the depth of cut.

1           21. A router as defined in claim 17 further comprising at least one depth  
2 stop turret member operative attached to said motor carrier assembly and being  
3 selectively movable into and out of contact with said indicator.

1           22. A router as defined in claim 21 wherein said at least one depth stop  
2 turret member specifies a predetermined distance from said indicator surface.

1           23. A plunge router comprising:  
2 a housing containing a motor for driving an output shaft to which a bit  
3 holding mechanism can be attached, a plunge locking mechanism for holding said  
4 housing at a particular vertical position along said guide posts;

5 a base structure having a pair of spaced vertical guide posts along which  
6 said housing can be vertically moved;

7 a depth control mechanism for establishing a desired depth of cut when  
8 said housing is vertically moved toward said base structure, said mechanism comprising:

9 a support member attached to said base structure;

10 an indicator operatively connected to said support member; and,  
11 an indicator surface located on said housing positioned to contact said  
12 indicator.

1 24. A router as defined in claim 23 wherein said support member is an  
2 elongated member and said indicator is an elongated tube having a pointer at its upper  
3 end, said indicator being adjustable relative to said support member.

1 25. A router as defined in claim 24 further comprising a spring for  
2 biasing said indicator upwardly into contact with said indicator surface.

1 26. A router as defined in claim 25 wherein said sub-base structure  
2 includes a depth scale located adjacent said pointer for providing a visual indication of  
3 the depth of cut.

1 27. A router as defined in claim 23 further comprising at least one depth  
2 stop turret member operative attached to said housing and being selectively movable into  
3 and out of contact with said indicator.

1 28. A router as defined in claim 27 wherein said at least one depth stop  
2 turret member specifies a predetermined distance from said indicator surface.

1 29. A method of operating a plunge router to specify a particular depth  
2 of cut of a router bit during operation, wherein the router is of the type which comprises a  
3 housing containing a motor for driving an output shaft to which a bit holding mechanism  
4 can be attached, a base structure having a pair of spaced vertical guide posts along which  
5 the housing can be vertically moved, a plunge locking mechanism for locking the housing  
6 relative to the base structure, and a depth control mechanism for establishing a desired



7 depth of cut, which includes a support member attached to the base structure, an indicator  
8 having a pointer operatively connected to the support member, a mechanism for locking  
9 the indicator relative to the support member, a depth scale adjacent the pointer, and an  
10 indicator surface located on the housing positioned to contact the indicator, said method  
11 comprising the steps of:

12               lowering the housing until the router bit contacts the surface the router is  
13 sitting on;

14               locking the housing at that vertical position;

15               setting a zero position by having the indicator contact the indicator surface  
16 of the housing and locking the indicator; and,

17               loosening the locking mechanism and loosening and lowering the indicator  
18 to the desired depth and then locking the indicator.

1               30. A method as defined in claim 29 wherein the step of lowering the  
2 indicator to the desired depth is carried out using the pointer in conjunction with the  
3 depth scale.

1               31. A method as defined in claim 30 further including inserting a turret  
2 member having a known thickness between the indicator surface and the indicator to  
3 thereby permit a large particular depth of cut to be carried out by cutting in successive  
4 increments.

1               32. A router comprising:

2               a motor assembly having a housing containing a motor for driving an  
3 output shaft to which a bit holding mechanism can be attached, operating handles

4 attached to said housing for use by an operator, and operating controls for operating said  
5 motor; and,

6 a fixed base assembly into which said motor assembly can be removably  
7 installed, said fixed base assembly having a planar bottom surface, a depth adjustment  
8 mechanism and a motor assembly locking mechanism for locking said motor assembly in  
9 said fixed base assembly.

1 33. A router as defined in claim 32 wherein said motor assembly further  
2 comprises a depth adjustment controller that controls the depth of cut of a bit when said  
3 motor assembly is installed in said fixed base assembly, wherein said depth adjustment  
4 controller comprises a knob that is located on the top of one side of the motor assembly  
5 housing, rotation of the knob causing the depth of cut to be increased or decreased  
6 depending upon the direction of rotation.

1 34. A router as defined in claim 32 wherein said fixed base assembly  
2 comprises a formed base portion having a vertical central opening in which a major  
3 portion of said motor assembly housing can be inserted, the outer configuration of the  
4 major portion of said motor assembly that is inserted generally conforming to the  
5 configuration of the inner surface of the formed base portion such that the motor  
6 assembly can be vertically moved therein during installation and removal and to adjust  
7 the depth of cut of an installed bit, said formed base portion having at least one segment  
8 of relatively thin wall around the circumference thereof, said first motor assembly  
9 locking mechanism comprising:

10 an elongated live hinge in said one thin wall segment, said hinge having  
11 one end integral with said wall and an unattached opposite free end;

12 a clamp lever operably attached to the outside of said formed base portion  
13 and pivotable between locking and unlocking positions, said clamp lever having a cam  
14 surface for engaging the free end portion of said hinge, said cam surface moving said free  
15 end portion inwardly to press against said motor assembly housing for securely holding  
16 the same when said clamp lever is pivoted into said locking position.

1 35. A router as defined in claim 34 wherein said live hinge is formed by  
2 an absence of wall material along the periphery of said hinge, said hinge being generally  
3 horizontally oriented and having one end integral with said wall, with the length of said  
4 hinge including its opposite end being unconnected to said wall.

1 36. A router as defined in claim 35 further comprising a set screw  
2 inserted in a threaded aperture located in said free end portion of said hinge, said set  
3 screw being rotatably adjustable to vary the amount of inward movement of said free end  
4 portion that occurs when the lever is pivoted into said locking position.

1 37. A router as defined in claim 34 wherein said major portion of said  
2 motor assembly housing that is inserted into said fixed base assembly has an outer  
3 configuration that varies sufficiently throughout its vertical dimension that would  
4 produce a deviation of the output shaft from perpendicular to said planar bottom surface,  
5 said major portion of said motor assembly housing having at least one vertical recess in  
6 the outer configuration opposite the side that is contacted by said live hinge, said recess  
7 extending from the bottom upwardly therefrom, said recess having a flat bottom that is

8 parallel to said output shaft, said fixed base assembly having an inwardly protruding  
9 vertically oriented rail with a top surface that is perpendicular to said fixed base planar  
10 bottom surface, said rail top surface engaging said recess flat bottom when said first  
11 locking mechanism clamp lever is pivoted into said locking position, thereby assuring  
12 that said output shaft is perpendicular to said fixed base planar bottom surface.

1           38. A router comprising:  
2           a motor assembly having a housing containing a motor for driving an  
3 output shaft to which a bit holding mechanism can be attached, operating handles  
4 attached to said housing for use by an operator, and operating controls for operating said  
5 motor;  
6           a plunge base assembly having a motor carrier assembly and a sub-base  
7 structure having a planar bottom surface and a pair of spaced vertical guide posts along  
8 which said motor carrier assembly can be vertically moved, a plunge locking mechanism  
9 for holding said carrier assembly at a particular vertical position along said guide posts,  
10 said plunge base assembly having a motor assembly locking mechanism for removably  
11 locking said motor assembly in said motor carrier assembly, and a first depth control  
12 mechanism for establishing a desired depth of cut when said motor carrier assembly is  
13 vertically moved toward said sub-base during operation.

1           39. A router as defined in claim 38 wherein said motor assembly further  
2 comprises a depth adjustment controller that provides controls the depth of cut of a bit  
3 when said motor assembly is installed in said motor carrier assembly, wherein said depth  
4 adjustment controller comprises a knob that is located on the top of one side of the motor

assembly housing, rotation of the knob causing the depth of cut to be increased or decreased depending upon the direction of rotation.

40. A router as defined in claim 38 wherein said motor carrier assembly comprises a formed base portion having a vertical central opening in which a major portion of said motor assembly housing can be inserted, the outer configuration of the major portion of said motor assembly that is inserted generally conforming to the configuration of the inner surface of the formed base portion such that the motor assembly can be vertically moved therein during installation and removal, said formed base portion having at least one segment of relatively thin wall around the circumference thereof, said second motor assembly locking mechanism comprising:

an elongated live hinge in said one thin wall segment, said hinge having one end integral with said wall and an unattached opposite free end;

a clamp lever operably attached to the outside of said formed base portion and pivotable between locking and unlocking positions, said clamp lever having a cam surface for engaging the free end portion of said hinge, said cam surface moving said free end portion inwardly to press against said motor assembly housing for securely holding the same when said clamp lever is pivoted into said locking position.

41. A router as defined in claim 40 wherein said live hinge is formed by an absence of wall material along the periphery of said hinge, said hinge being generally horizontally oriented and having one end integral with said wall, with the length of said hinge including its opposite end being unconnected to said wall.

1           42. A router as defined in claim 40 further comprising a set screw  
2 inserted in a threaded aperture located in said free end portion of said hinge, said set  
3 screw being rotatably adjustable to vary the amount of inward movement of said free end  
4 portion that occurs when the lever is pivoted into said locking position.

1           43. A router as defined in claim 40 wherein said major portion of said  
2 motor assembly housing that is inserted into said motor carrier assembly has an outer  
3 configuration that varies sufficiently throughout its vertical dimension that would  
4 produce a deviation of the output shaft from perpendicular to said sub-base planar bottom  
5 surface, said major portion of said motor assembly housing having at least one vertical  
6 recess in the outer configuration opposite the side that is contacted by said live hinge,  
7 said recess extending from the bottom upwardly therefrom, said recess having a flat  
8 bottom that is parallel to said output shaft, said motor carrier assembly having an  
9 inwardly protruding vertically oriented rail with a top surface that is perpendicular to said  
10 fixed base planar bottom surface, said rail top surface engaging said recess flat bottom  
11 when said second locking mechanism clamp lever is pivoted into said locking position,  
12 thereby assuring that said output shaft is perpendicular to said sub-base planar bottom  
13 surface.

1           44. A router comprising:  
2           a motor assembly having a housing containing a motor for driving an  
3 output shaft to which a bit holding mechanism can be attached, operating handles  
4 attached to said housing for use by an operator, and operating controls for operating said  
5 motor; and,

6 a fixed base assembly into which said motor assembly can be removably  
7 installed, said fixed base assembly having a planar bottom surface, a depth adjustment  
8 mechanism and a first motor assembly locking mechanism for removably locking said  
9 motor assembly in said fixed base assembly

1 45. A router as defined in claim 44 wherein said motor assembly further  
2 comprises a depth adjustment controller that provides controls the depth of cut of a bit  
3 when said motor assembly is installed in said motor carrier assembly, wherein said depth  
4 adjustment controller comprises a knob that is located on the top of one side of the motor  
5 assembly housing, rotation of the knob causing the depth of cut to be increased or  
6 decreased depending upon the direction of rotation.

1 46. A router motor assembly that is capable of being removably installed  
2 in a fixed base and operate as a fixed base router or is capable of being removably  
3 installed in a plunge base and operate as a plunge router, said motor assembly comprising  
4 a housing with a motor for driving an output shaft to which a bit holding mechanism can  
5 be attached for holding a tool bit, operating handles attached to said housing for use by an  
6 operator, and operating controls for operating said motor.

1 47. A router motor assembly as defined in claim 46 further comprising a  
2 depth adjustment controller that provides controls the depth of cut of the tool bit when  
3 said motor assembly is installed in either said fixed base or plunge base, wherein said  
4 depth adjustment controller comprises a knob that is located on the top of one side of the  
5 motor assembly housing, rotation of the knob causing the depth of cut to be increased or  
6 decreased depending upon the direction of rotation.

1           48. A router motor assembly as defined in claim 46 wherein said  
2 operating handles comprise a pair of handles, each of which has a generally horizontal  
3 shoulder portion which extends from an opposite side of said housing and which merge  
4 with a generally vertical grip portion that extends downwardly from the shoulder portion,  
5 the bottom end of said grip portions extending to an elevation that can approach the  
6 elevation of said bottom of the base in which said router motor assembly is installed to  
7 thereby provide added stability during operation.

1           49. A router motor assembly as defined in claim 48 wherein said  
2 operating controls include an on/off motor switch located in one of said handles.